Sierra Valley Technical Advisory Committee Meeting Summary: January 11, 2021

ACTION ITEMS

ACTION ITEM: The Project Team will provide in-person meeting options for the February meeting.

ACTION ITEM: Send out information on optional orientation to the data portal, which will take place immediately prior to the February TAC meeting.

ACTION ITEM: Provide a recap of comments by topic, with some background information including currently available data.

ACTION ITEM: The February TAC meeting will include a first look at the general direction for Sustainable Management Criteria (SMC) for both Groundwater Quality and Subsidence.

ACTION ITEM: Cross-check map of agricultural wells with information from SVGMD.

Welcome, Introductions, Agenda Review

The third meeting of the Technical Advisory Committee (TAC) for the Sierra Valley (SV) Groundwater Sustainability Plan (GSP) was held virtually due to COVID-19 protocols. The meeting agenda was reviewed, followed by introductions and reminders remote meeting practices. The topics for this meeting covered:

- A look ahead regarding scheduling of expected activities over the next few months
- Report out on responses to the surveys for groundwater quality and subsidence
- Discussion on the monitoring approach and data management

There were 22 participants: 14 TAC members, 2 ex-officio members, 2 planning committee members and 8 project team members.

Project Updates

DECEMBER TAC: Draft Meeting Summary

Bringing up the project website, Judie Talbot (GSP outreach facilitator) pointed to the December meeting summary. These notes are intended to help document the conversation. Meeting participants were invited to submit any changes, if comments were not correctly tracked. (None were received.)

UPDATE OF THE GSP COMMUNICATION AND ENGAGEMENT (C & E) PLAN

The revised C & E Plan is posted on the website at www.sierravalleygmd.org/files/7bfe5a69a/Sierra+Valley+C%26E+Plan+-rev.+12.30.2020.pdf. New text includes the following sections:

- the work of the TAC and changes due to COVID-related constraints,
- legislative requirements for outreach, and
- updated timelines and scopes of work for the GSP.

The updated C & E Plan will be presented to the GSAs at the January 18, 2020 Board Meeting of the Sierra Valley GMD. As a living document, the plan will be revisited and revised as necessary.

UPCOMING SCHEDULE: LOOK AHEAD

Cab Esposito, LWA Assistant Technical Project Manager, highlighted the work for the February and March TAC Meetings.

February:

- Present suggested approach for Modeling Network and Sustainable Management Criteria (SMC) for Groundwater Quality
- Introduction of approach for Groundwater Dependent Ecosystems (GDEs)
- Options for model development

March:

- Refinement of approach for Groundwater Dependent Ecosystems (GDEs)
- Introduce preliminary approach for Sustainable Management Criteria (SMC) on declining groundwater levels
- Water budgets for historic, current and future conditions in Sierra Valley

Development of the GSP will be a highly iterative process, with opportunities to see draft text at multiple times. There are many feedback loops with chances to revisit text if new information becomes available. Also, there will be another review before the Public Review Draft of the GSP is released. Due to the timeline, reviews of draft text for the GSP will move ahead at a steady rate.

Recap: Survey Responses on Groundwater Quality and Subsidence

Cab provided a recap of the survey responses, noting there were 9 responses including 3 from non-TAC members. The responses are greatly appreciated and allow the technical team to better understand where there are concerns and the different levels of understanding. He thanked respondents for submitting their replies.

One TAC member explained that the survey would have benefited from some additional background. It was challenging to answer the survey questions with the data currently available. It would also be helpful to talk about the beneficial aspects of groundwater uses in Sierra Valley. Judie noted that some of that discussion would appear in the description of the Basin Settings. That text will start to be introduced in February and March. There is quite a bit of work being done on the beneficial uses of groundwater, although the focus now is on required elements of the GSP (relating to sustainability indicators). There will be discussion on protecting groundwater use for economic and agricultural activities.

In terms of informed survey responses, going forward there is an option to provide greater background for each of the survey questions. This can be incorporated into the question itself. Those questions could also be pre-tested, to make sure there is enough background. The survey responses did also highlight where respondents thought more information was needed before providing recommendations.

<u>Groundwater Quality Survey</u>

Cab summarized the responses on groundwater quality, which reflected the levels of participants' interests and concerns about respective Constituents of Concern. Nitrate and boron were flagged as

needing attention. Responses (5 of 8) also indicated that Maximum Contaminant Levels (MCLs) were a reasonable approach or starting point for setting Sustainable Management Criteria (SMC). There was very strong support (8 of 9) for establishing triggers or warning levels for the different Constituents of Concern (COCs).

As noted in the presentation, data gaps do exist. For example, information on private domestic wells is not available. Suggestions were offered on how to obtain information on domestic wells, including partnering with UCCE outreach and the possibility of no-cost testing. Another data gap exists in that some COCs are not currently being monitored. Respondents also helped identify existing wells and monitoring efforts. There is an interest in seeing additional monitoring for industrial and higher-population areas in the basin, as well as trying to identify any drinking water wells with MCL exceedances or wells with any impacts from high-production pumping. Lastly, there is a hope to better understand the aquifer, especially the influence of the Grizzly Fault Line and the clay layer.

Subsidence

Regarding subsidence most respondents (6 of 7) did not notice any effects of subsidence. However, one participant noted changes in seasonal ponds, artesian wells and flood levels during drought. There was unanimous support for considering impacts of subsidence on private infrastructure. When asked about how much subsidence was too much, responses varied from several inches to several feet. Notably, this question sought to get a high-level understanding of people's perceptions of subsidence There was unanimous support to continue current ground elevation surveys. In determining what levels of subsidence are reasonable, attention will focus more on the impacts of subsidence and less on any specific change in elevation.

In response to a question, it was explained that subsidence can occur when there has been long-term pumping or where clay layers have collapsed. Impacts are likely to be seen where these two conditions overlap. Also, ground levels immediately adjacent to well casings are not good indicators of whether subsidence has occurred. Specifically, the ground around the casing may become compacted – causing the casing to hang above the ground surface.

Modeling Approach and Data Management

Gus Tolley, SBS&A Hydrogeologist, started the presentation on the modeling approach. At some point, there will be a cutoff for changing the inputs that help create the model. Until then, comments are welcome.

He explained that models are especially helpful in generating water budgets, which are required elements of a GSP. Models are also valuable for considering "what-if" options for management actions, to see what the projected results would be. They also help generate consensus and shared understanding of key basin conditions.

The Sierra Valley Integrated Hydrologic Model is actually comprised of three different models:

- Upper Watershed Model (streamflow entering Sierra Valley - PRMS)
- Soil-Water Budget Model (recharge and pumping within Sierra Valley - SWBM)
- Groundwater-Surface Water Model (groundwater levels and streamflow within the valley - MODFLOW)

Looking at map, the green area represents the area of the Upper Watershed Model and the yellow area represents the areas of the SWBM and MODFLOW models. The rectangular grid has been rotated to better align with known faults, which affect groundwater flow patterns. (Specifically, flows increase in the direction of the fault, and flows decrease across the fault.)

Precipitation-Runoff Modeling System - PRMS (for the upper watershed)

Shey Rajagopal, a hydrometeorologist with DBS&A, works with modeling especially in the area of changing climate patterns. He discussed the PRMS model which looks at the relationships between precipitation, soil moisture and the *amounts of runoff and groundwater recharge* coming into Sierra Valley. While these are the two major components of interest, the model also accounts for other elements of the larger water system such as evapo-transpiration and snowpack.

This model uses standard existing datasets for elevation, soil types, impervious cover, climate, vegetation and hydrography. For the upper watershed (PRMS model), it was noted that while smaller streams are not directly calculated into the model, their flows are captured as they coalesce into larger streams. However, the MODFLOW needs to be instructed as to what the stream network actually consists of.

DISCUSSION – surface water features:

1. Frenchman Lake and Lake Davis have been identified for the model. Are there other reservoirs or bodies of water (that hold significant amounts of water) in the upper watershed?
    - Walton's Grizzly Lodge has a small pond supplied by Lake Davis
2. Are the perennial streams within the valley basin accurate and complete? These are the regularly flowing streams or those contributing significant amounts of water. Are there any shown that could be eliminated due to intermittent flows?
    - Comment: Some of the indicated streams (in the yellow area of the valley model) are actually irrigation channels based on diversions.
      Response: The upper watershed model itself treats streams and irrigation conveyances in the same way – as flows that bring water to the valley. It will be important to know which ones are irrigation canals, as they will have different options for management. The goal is to represent the key elements, rather than streams that flow intermittently. Also, the canals could be physically marked up on large maps.

      Comment: DWR should have information on the irrigation water decree location of water diversions. Some surface water supplies in the Truckee River watershed are diverted to Sierra Valley by Sierra Valley Mutual Water Company. From Frenchman's Reservoir, another adjudicated flow feeds agricultural operations that are a part of the Little Last Chance Creek Water District. These flows are monitored and adjusted by the DWR watermaster.
    - Question: How is imported water represented? For example, supplies from the Little Truckee.
      Reply: Imported water will be an input in the surface water-groundwater model.

- Question: What assumptions are there regarding how surface water connects with groundwater? In the model, there must be an assumed connection of groundwater and surface water.
  Response: The model cells have basically two values for surface water and groundwater. There is the groundwater "head" (or level) for that cell; the stream cell has a "head" or elevation. If the groundwater level is higher than the stream – then the groundwater flows into the stream. Conversely, higher stream water levels (compared to groundwater levels) will result in stream flows (of recharge) to the aquifer. There is also a factor for restrictive layer, called stream bed conductance. The higher the conductance, the harder it is to transfer water across the bed stream. There will be more discussions about model calibration in the future.
  Comment: There is not much information about the geology of the upslope areas, so it's not clear how water is moving downslope. Ultimately, the model is just a model – and a great tool for discussion. It does not necessarily represent reality. There needs to be a feedback loop from the land users, landowners, and land managers to ground-truth model results.
  Response: There are good measurements for groundwater heads in the valley. Modeling is certainly an iterative process, with feedback from water users. For example, cutting schedules can be represented as deficit irrigation in the model. If the model results are not realistic, it's necessary to find out why. The technical team is looking to ensure that quality information is going into the model.

  Comment: Burkhard Bohm did radio isotope studies that showed the deep aquifer is being recharged from the surrounding mountain tops. See: www.sierravalleygmd.org/2-24-17-sgma-and-groundwater-study-workshop.

- Question: Does the model account for the export of water from the SV Basin from the headwaters of the Middle Fork Feather River?
  Response: It will be possible to account for the water that naturally flows out of Sierra Valley into the Middle Fork, although that's not currently being done.

- Question: Can the model be used to show possible mitigations? For example, are there management actions on the upslope that could increase residence time of water in the basin?
  Response: Yes. That's an example a "what-if" scenario that could be looked at.

- Comment: The maps show some interesting insights. In March, there are probably only 10 streams that make it to the valley floor.

Soil-Water Budget Model – SWBM (for the valley floor)

Gus Tolley explained that the model represents recharge and pumping in the valley. These values can change with spatial distribution across the valley. This looks at the yellow area of the map. In thinking about a cube of soil, the soil has some level of capacity for holding water. When the soil moisture drops below the maximum allowable depletion level, irrigation is triggered. When the soil moisture exceeds the water holding capacity, water starts to be discharged from the soil to groundwater (as recharge).

The amount of irrigation water applied is a factor of 1) the amount of water used by a crop, including evapotranspiration and 2) irrigation efficiency. The model calculates irrigation needs for every field. The model also tracks the source of irrigation water (stream sources for surface water, well sources and pumping for groundwater). A resulting map shows the characteristics of irrigated fields.

Land Use

Land use within the valley was broken out as: pasture, alfalfa/grain, native vegetation and barren/urban. The acreage from model outputs were compared to values from DWR crop mapping. It's important to distinguish different evapotranspiration coefficients. In addition to the discussion at the meeting, people can provide comments using the Google sheet at

DISCUSSION – land use:

1. Are these categories of land use sufficient for representing agricultural water use in the valley?
    - There is some dryland farming. Also, alfalfa become feed in the fall.
    - There are irrigated fields for grass/hay.
2. Is the distribution of land use categories accurate?
    - There is a lot of the green area that is not irrigated at all.
3. Have there been any significant use changes in the valley since October 1, 1999?
    - There are new wells and new pivots, some areas are now inactive.

In response to a question about how models will be updated in the future, Gus replied that the models are designed to be easily updated – especially by automating inputs from the data files. The five-year updates of the GSP would provide another opportunity to update the model.

Water-Holding Capacity

One of the model parameters is the water-holding capacity of soil, which reflects the amount of water that can be held under gravity. For example: course sandy soils have the lowest water-holding capacity. Silty loam soils have intermediate water-holding capacity and soils composed of silts and clays have the highest water-holding capacity.

Irrigation Type

Irrigation type will inform the level of irrigation efficiency. A table showed the breakdown of acreage according to irrigation type: flood, wheel line, center pivot and non-irrigated – as well as level of irrigation efficiency.

DISCUSSION – irrigation type:

1. Is this distribution of irrigation methods accurate for the valley?
    - Comment: Some pivots have been retired. The general distribution is about right.
    - Question: Will the model account for any fields that may be irrigated with surface water that may switch to groundwater?
      Response: That option could be added to the model, if there was a significant amount of acreage that used both groundwater and surface water.

- Question: Does the model account for the effects of soil type (and water-holding capacity) on irrigation?
  Response: Since irrigation is triggered by dropping below a certain percentage of water-holding capacity, soil with greater water-holding capacity gets irrigated later in the season.

2. Are there other irrigation methods used in the valley?

Water Source

Gus Tolley showed a map illustrating the sources of irrigation water: surface water, groundwater, mixed and non-irrigated. The technical team is especially interested in whether there are fields sustained by shallow groundwater (e.g., sub-irrigation).

- Comment: There are fens (marshy areas) along the southern edge of the valley with native vegetation.
- Comment: There is probably a fair amount of land that stays moist and sustains vegetation; it would be hard to try and quantify that. It may be a significant amount of acreage, more in the Sierraville and Calpine area.

There is a map that tries to connect agricultural fields to specific production wells. This works well in some areas, but not in others. Knowing which wells are irrigating which fields will improve the accuracy of the model.

DISCUSSION – irrigation type:

1. Are the wells associated with groundwater irrigated field accurately represented?
2. Are any irrigation wells missing?
3. Are there any groundwater irrigation wells no longer being used?

   Comment: Perhaps some irrigation is being provided by stock wells or domestic wells.
   Response: This is where local knowledge is especially important.
   Comment: The Groundwater District already is metering all of the large irrigation wells – are those part of your database? Check this against the information available from the District. Some of the wells being metered do not show up on this map.
   Comment: The map is not consistent with District information.

Irrigation Timing

Gus used Scott Valley as an example to show the time periods when 1) evapotranspiration was occurring and 2) when irrigation was occurring. Participants were asked to describe the time periods appropriate to Sierra Valley for:

- When growing seasons start and end for each crop type.
- When irrigation typically starts and ends for each crop type.

Tracy Schohr reported that UCCE recently completed interviews with growers and would be able to share the results by the next TAC meeting.

Comment: Alfalfa irrigation generally starts in mid-April and extends into September.

Comment: A fall grain crop might start in mid-April and extend into October. There can be two crops of grain, or grain and a cover crop. In those cases, water is being used for the whole summer.
Comment: There are some exceptions that are probably not large enough to change the model.
Comment: The pasture dates are pretty consistent; irrigation for a single crop of grain starts in April and extends into July.

Irrigation Triggers

Typically, you check the soil moisture by digging down about 18" and seeing if you can form a ball. There are not a lot of soil moisture sensors in Sierra Valley basin. Tracey Schohr will check to see if there are any soil moisture triggers for irrigation. Some soil moisture sensors will be installed in the valley this spring.

- Comment: With frost even into June, sometimes irrigation only occurs during the day.
  Response: Averaging over longer periods of time will help smooth out those variations.
- Question: Doesn't the water master influence when water is available for flood irrigation?
  Comment: That's right for pasture., which uses surface water supplies based on water rights.
  Comment: The date for flood irrigation is March 15 through October 1.

Crop Rotation

Asking about crop rotation schedules, participants reported that alfalfa cycles are 9 years of alfalfa with one year of grain/hay. Sierra Valley probably has one fewer cut per year, compared to Scotts Valley.

Next Steps

A Doodle poll will go out to set the meeting dates for February and March.

- The meeting location will be determined and announced in a later email (it may be a virtual meeting)

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Participants

TAC MEMBERS

X = attendance

	Organization, Name		Organization, Name
	City of Loyalton Brooks Mitchell	X	Sierra County Environmental Health Elizabeth Morgan
X	Feather River Land Trust Ken Roby		Sierra County Public Works Tim Beals
X	Feather River Trout Unlimited William Copren		Sierra Valley Groundwater Mgmt. District Dave Goicoechea
X	Hinds Engineering Greg Hinds	X	Sierra Valley Resource Conservation District Rick Roberti
X	Integrated Environmental Restoration Svcs. Michael Hogan	X	Sierraville Public Utility District Tom Archer and Paul Rose (alternate)
X	Plumas Audubon Jill Slocum	X	UC Cooperative Extension Tracy Schohr
X	Plumas County Tracey Ferguson and Tim Gibson (alternate)		Upper Feather River IRWM Uma Hinman
X	Plumas County Environmental Health Rob Robinette	X	USFS – Plumas National Forest Joe Hoffman
X	Sierra Brooks Water System Tom Rowson	X	USFS – Plumas National Forest Rachel Hutchinson

EX-OFFICIO MEMBERS

X	CA Department of Water Resources Debbie Spangler	X	CA Department of Fish and Wildlife Bridgett Gibbons

TECHNICAL TEAM & PLANNING COMMITTEE

X Einen Grandi, SVGMD Board Chair

X Laura Foglia, LWA Project Manager

X Betsy Elzufon, LWA Asst. Project Mgr. (admin)

X Cab Esposito, LWA Asst. Project Mgr. (techn'l)

X Shey Rajagopal, DBS&A Hydrometeorologist

X Judie Talbot, Outreach Facilitator

X Gus Tolley, DBS&A Hydrogeologist

X Kristi Jamason, Planning Committee